Remarks

I.   Introduction

This Amendment is in response to the Final Office Action dated August 4, 2009. This Amendment is being filed with a Request for Continued Examination.

The Office Action rejected claims 1-10, 21, and 25 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,985,928 ("Zhang") in view of Ratnasamy et al., "A Scalable Content Addressable Network" (Ratnasamy").

In response, Applicants have amended claims 1, 3 and 4. Applicants have cancelled claim 2. Claims 11-20, 22-24, and 26-27 were cancelled previously.

Claims 1, 3-10, 21 and 25 remain for consideration. No new matter has been added.

II.   Claims Rejections Under § 103

Claims 1-10, 21, and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Ratnasamy. Claims 1, 3 and 4 have been amended and the rejection is respectfully traversed. Claim 2 has been cancelled.

In order to "establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art." In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, "all words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). See also MPEP § 2143.03. The cited references do not disclose or suggest all of the claim limitations of independent claim 1,

as amended. Therefore, Applicant requests the withdrawal of the rejection under 35 U.S.C. § 103(a).

The present invention is directed to an improved method for managing information in a peer-to-peer network. In an exemplary embodiment, each node in a peer-to-peer network has a given amount of physical storage capacity, and hosts a number of fixed-size storage slots. (Paragraph [0017]). In accordance with a virtualization technique referred to as "oversubscription," each node hosts a number of (virtual) storage slots corresponding to a total amount of storage space larger than the actual physical storage capacity of the node. ([0022]). At each node, a first portion of the storage slots are allocated to hold one or more storage zones, and a second portion of the storage slots are allocated to remain unused as a "free slot reserve." ([0004]). When a storage zone becomes full (or nearly full), the storage zone is split. A storage slot from the free slot reserve is converted to hold a new storage zone, and data from the filled-up storage zone is transferred to the new storage zone. ([0004]).

A. Independent Claim 1

Claim 1 defines a method for improving utilization in a peer-to-peer network having a plurality of nodes. Claim 1 requires "hosting one or more storage slots in each node in the peer-to-peer network." Claim 1 has been amended to recite: "<u>each node comprises a respective amount of physical storage capacity</u>," "<u>each storage slot represents a predefined amount of storage capacity</u>," and "<u>each node hosts a number of storage slots representing a total amount of storage capacity greater than the node's</u>

physical storage capacity." Claim 1 has been further amended to recite: "at each node, a first portion of the storage slots host storage zones and any remaining storage slots are allocated as free slot reserve storage slots." Claim 1 also requires "storing data in the storage slots hosting storage zones." In addition, claim 1 recites that "when a storage slot hosting a storage zone reaches a full capacity of the storage zone," the following steps are followed: "splitting the data in the storage slot hosting the storage zone into a first and second portion," "converting a free slot reserve storage slot into a new storage slot hosting a storage zone," and "transferring the second portion of the data to the new storage slot hosting the storage zone." Support for the amendments to claim 1 is found at least at paragraph [0022].

Zhang discloses a system that includes a plurality of nodes functioning as peers in a peer-to-peer system. (Col. 2, lines 27-28). The system is divided into a plurality of zones in which objects are placed. (Abstract). Each object (e.g., a directory, a file, etc.) resides in a zone and may contain names and location information of children objects. (Col. 2, lines 63-66; col. 3, lines 55-58). New objects are placed in the system using a zoom-in algorithm that begins by identifying a zone where a parent object lives. (Col. 3, lines 47-56). The parent zone is divided into two sub-zones, and a child object is placed into one of the sub-zones. (Col. 3, lines 63-67).

Ratnasamy discloses a distributed content-addressable network that provides hash table-like functionality. (Abstract).

Neither Zhang nor Ratnasamy teaches or suggests "each node hosts a number of storage slots representing a total amount of storage capacity greater than the node's

physical storage capacity," as required by amended claim 1. The Examiner asserted, in the rejection of claim 2, that Zhang shows this feature at "at least col. 4 line 39 – col. 5 line 34." (Office Action, page 4). Applicants respectfully disagree. Nowhere in the cited passage does Zhang teach or suggest a node that hosts zones and/or sub-zones representing a total storage capacity "greater than" the physical storage capacity of the node itself, as required by amended claim 1.

Ratnasamy also fails to teach or suggest this limitation. Therefore, amended claim 1 and its dependent claims are patentable over Zhang and Ratnasamy.

B.   Amended Claim 3

Claim 3 depends from amended claim 1 and further recites, "wherein each node is allocated 2 x N -1 virtual slots, where N equals the physical storage capacity of the node divided by the predefined amount of storage capacity of a storage slot." Support for the amendments to claim 3 is found at least at paragraph [0022].

Neither Zhang nor Ratnasamy teaches or suggests the limitations of amended claim 3. The formula recited by amended claim 3 requires that each node be allocated 2 x N-1 slots, which results in a number of slots representing a total amount of storage capacity that is larger than the physical storage capacity of the node itself. As discussed above, neither Zhang nor Ratnasamy teaches or suggests this feature.

Therefore, amended claim 3 is patentable over Zhang and Ratnasamy.

In addition, amended claim 3 is patentable by virtue of its dependency from amended claim 1, which is patentable over Zhang and Ratnasamy for the reasons presented above.

C.   Claims 4 and 6

Claim 4, as amended, depends from amended claim 1 and further recites "wherein a storage zone at a node is transferred to another node in the peer-to-peer network if the data inserted into the storage zones at the node fills the actual physical capacity of the node." Neither Zhang nor Ratnasamy teaches or suggests transferring a zone from one "node" to another "node" when the "actual physical capacity of the node" is filled, as required by amended claim 4. For example, the hill-climbing algorithm disclosed at column 4, line 66 – column 6, line 29 of Zhang is used to identify a node where a child object should be placed, but is not used to <u>transfer</u> a child object, or a zone, or any other object or entity, from one node to another node, as claimed. Therefore amended claim 4 is patentable over Zhang and Ratnasamy.

Claim 6 depends from amended claim 1 and further recites "wherein the new storage zone is transferred to and hosted by a free slot reserve storage slot on a different node when the storage zones hosted at the node exceed the storage slots allocated at the node." For the reasons discussed above with respect to claim 4, neither Zhang nor Ratnasamy teaches or suggests a "new storage zone" that is "transferred" from one node to a "different node," as required by claim 6. Therefore claim 6 is patentable over Zhang and Ratnasamy.

In addition, claims 4 and 6, as amended, are patentable by virtue of their dependency from amended claim 1, which is patentable over Zhang and Ratnasamy for the reasons presented above.

D. Remaining Claims

All remaining claims are patentable over Zhang and Ratnasamy by virtue of their dependency from amended claim 1, which is patentable for the reasons presented above.

III. No New Matter

The amendments to claims 1, 3 and 4 do not add new matter. Support for these amendments can be found at least at paragraph [0022], as discussed above.

IV.   Conclusion

For the reasons presented above, all pending claims are allowable over the cited art. Reconsideration and allowance of all claims is respectfully requested.

Respectfully submitted,

/Jeffrey M. Weinick/
Jeffrey M. Weinick
Reg. No. 36,304
Attorney for Applicant
Tel.: 973-530-2028

Date: November 3, 2009
NEC Laboratories America, Inc.
4 Independence Way
Princeton, NJ 08540
Tel No. 609 951-2522
Fax No. 609 951-2480

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